# adaptec

# ARO™-1130SA
# PCI RAID Option Card

## Cost-effective, high-performance array upgrade for motherboards with RAIDport® II on board

### Key Benefits

**Built-in, flexible upgrade path**
The ARO-1130SA RAID option card provides a scalable design solution. Systems can be easily upgraded to RAID by installing a low-cost option card. A motherboard with the embedded RAIDport II slot will accommodate one ARO-1130SA RAID option card.
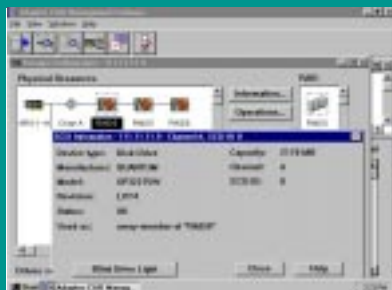
**Most cost-effective array solution**
The RAIDport II connector makes a motherboard with embedded Adaptec AIC-7895 or AIC-7880 Ultra SCSI chips RAID-ready. Installing the ARO-1130SA RAID option card automatically upgrades the motherboard from SCSI to RAID. And utilizing already embedded Ultra SCSI chips as RAID channels reduces the complexity and cost of the ARO-1130SA RAID option card, while leveraging the investment in SCSI.

**Robust fault tolerance**
The many extra features for improved storage system uptime, such as hot-swap and hot-spare drive support; dynamic sector repairing; S.M.A.R.T. drive and SAF-TE support make the low-cost ARO-1130SA RAID option card the preferred choice to optimize storage fault tolerance for entry-level servers.

## Product Highlights

- Enables Adaptec Ultra SCSI chips on the motherboard to perform as SCSI RAID channels

- Supports RAID levels 0 (striping), 1 (mirroring), 0/1, and 5

- Improves performance using Adaptec's AIC®-7815 RAID co-processor

- Makes installation quick and easy with Adaptec ArrayConfig™ SA software

- Simplifies array management with easy-to-use Adaptec CI/O Management Software™

### Overview

Faced with the choice between either the slow performance of RAID-like software that is embedded within the network operating system or the prohibitive cost of high-end array solutions, users deploying entry-level servers for small businesses and departmental workgroups often settle for the weak data protection provided by the network operating system. Now they no longer have to compromise.

The ARO-1130SA RAID option card optimizes performance and cost while providing robust fault-tolerant storage for entry-level servers. The ARO-1130SA RAID option card is ideal for improving data availability without sacrificing performance in systems with a PCI-RAIDport II connector on the system motherboard.

Factory installed memory

ARO-1130SA card

Sample ARO-1130SA install

RAIDport II
edge-connector

Motherboard featuring
RAIDport II slot

Adaptec
SCSI ASIC

PCI-RAIDport II slot

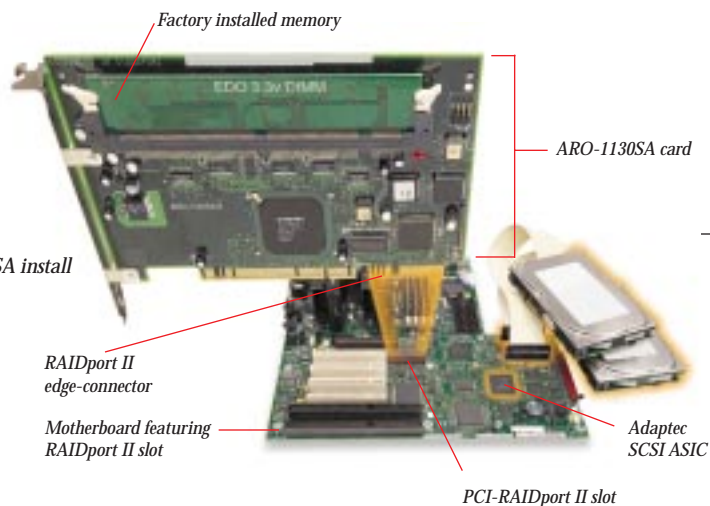*Adaptec CI/O Management Software*



*Zero-in on individual servers and arrays*



*Keep track of everything that happens*



*Pick and click to configure arrays*

## High performance

The ARO-1130SA RAID option card delivers data over the network faster than native operating system RAID-like software.

The superior performance of the ARO-1130SA RAID option card stems from the same efficient I/O design that has made Adaptec's host adapters the industry standard.

Incorporating a dedicated Adaptec AIC-7815 RAID co-processor, the ARO-1130SA RAID option card manages DRAM memory and offloads RAID 1 secondary writes and RAID 5 parity calculations from the host CPU, freeing it for other tasks. The DRAM memory module is isolated from the data path and memory is automatically bypassed when direct data transfer offers better performance.

## Broad compatibility

The ARO-1130SA RAID option card has undergone extensive testing to ensure compatibility with the widest range of peripherals and network operating systems. Fully compatible with Adaptec's AIC-7895 or AIC-7880 Ultra SCSI chips, the ARO-1130SA solution supports Wide Ultra SCSI, Fast/Wide SCSI, and SCSI devices from major vendors. The ARO-1130SA RAID option card works under Windows NT®, and NetWare operating systems.

This broad compatibility allows more choice in peripherals and protects users' hardware and software investments.

## Choice of RAID levels

The ARO-1130SA RAID option card supports up to four arrays in any combination of RAID 0, 1, 0/1, or 5 to meet the availability and performance requirements of different network applications.

RAID 0 stripes data across multiple disks without redundancy, speeding data access when performance is the top priority. RAID 1 mirrors data, providing full data redundancy but doubling the storage requirements. RAID 0/1 combines the protection of mirroring with the high performance of data striping. RAID 0/1 is the only RAID level that can tolerate multiple drive failures so it provides the highest availability and performance for business-critical applications. RAID 5 is an economical solution for protecting data at a much lower storage cost than mirroring. It provides the best balance of fault-tolerance, performance, and storage cost for most applications.

## Simple installation

The ARO-1130SA RAID option card is easily installed and configured. Just install the ARO-1130SA RAID option card into the RAID*port* II PCI slot. Then run Adaptec Array*Config*SA software from the bootable floppy disk provided and follow a few simple menu-driven steps to configure drives into arrays. Adaptec Array*Config*SA software enhances fault-tolerance by letting users set up initial array configuration before installing the operating system.

## Advanced Features

| | ARO-1130SA RAID Option Card |
|---|:---:|
| RAID co-processor | ■ |
| Uses same cabling as motherboard SCSI | ■ |
| Multiple operating system support | ■ |
| Bootable array support | ■ |
| Array configuration on disk | ■ |
| Data striping (RAID 0) | ■ |
| Mirroring (RAID 1) | ■ |
| Data striping with distributed parity (RAID 5) | ■ |
| Hot-swap drive support | ■ |
| Hot-spare standby | ■ |
| Dynamic sector repairing | ■ |
| S.M.A.R.T. drive support | ■ |
| SAF-TE support | ■ |

### Convenient array management

Adaptec CI/O Management Software takes the complexity out of array management. It is the network managers control center for monitoring and managing disk storage for the entire network. Arrays can be managed remotely from any PC on the network.

See the big picture. From a single location, network managers can view all the servers on the network that have Adaptec array products installed.

Zero-in on individual servers and arrays. Network managers can drill down to view any system of interest. They can see at a glance both physical and logical array configurations that belong to that system. The interface maps and monitors other SCSI devices on the ARO-1130SA RAID option card as well as hard disk drives.

Keep track of everything that happens. Alerts, color coded by severity, keep network managers informed of all events throughout the network. Adaptec CI/O Management Software captures detailed information, including the affected server, date and time, and a description of the event. Event logs are collected on each system, not on the monitoring system. This means that all events are reported, even if the monitoring system has been shut down for a time.

Pick and click to reconfigure arrays. To reconfigure arrays from their PCs, managers simply highlight the desired number of drives. Adaptec CI/O Management Software presents allowable RAID level options. Then to help simplify the decision, bar graphs show the tradeoffs in data protection and performance for each option as well as the difference between available and required storage capacity.

### Troubleshoot problems remotely

Without leaving their desks, network managers can:
- Determine which drives have failed
- Initialize arrays
- Reactivate off-line drives
- Verify parity
- Blink individual drive lights or the lights of all drives in an array
- Pause I/O to permit the removal of drives that aren't hot-pluggable

Drives equipped with Self-Monitoring, Analysis and Reporting Technology (S.M.A.R.T.) report predicted failures to Adaptec CI/O Management Software. With this advance warning, network managers can activate a spare remotely before problems arise.

### Schedule management activities

Network managers can schedule activities, such as verifying all the disks in each array, testing spare drives and reconstructing devices. These activities are carried out automatically, on schedule, whether the network manager is in attendance or not.

### Adaptec quality and reliability

The ARO-1130SA PCI RAID option card delivers the same high standard of quality and reliability that has made Adaptec the market leader in I/O solutions.

As with all Adaptec products, the ARO-1130SA RAID option card has passed comprehensive functional and mechanical inspections and tests in three separate laboratories: the Adaptec Functional Test Lab, Adaptec Product Test Lab and the Adaptec Compatibility Test Lab.

Adaptec's manufacturing facility has earned ISO-9002 international certification, which ensures compliance to a high level of quality in product design and production.

Trusted for quality and reliability, Adaptec products are incorporated into the products of virtually all major computer and peripheral manufacturers.

**adaptec** ®

**We move the information that**
**_moves_ your world.™**

## TECHNICAL SPECIFICATIONS

| | |
|---|---|
| Computer Bus: | 32-bit PCI Local Bus plus RAID*port* II connector |
| Interface Protocol: | Bus Master DMA |
| Host Bust Data Transfer Rate: | Up to 133 MByte/sec burst rate |
| SCSI Synchronous Data Rate: | AIC-7895: up to 80 MByte/sec (40 MByte/sec per channel) |
| | AIC-7880: up to 40 MByte/sec per channel |
| Device Protocol: | Ultra SCSI, Fast, and Wide (8- and 16-bit) 20 MHz |
| Advanced RAID Features: | RAID co-processor |
| | Hot spare (pool and dedicated) |
| | Hot swap of drives |
| | Array configuration on disk |
| | SAF-TE support |
| | User-defined rebuild priority |
| | User-defined verify priority |
| | Bootable array support |
| | Hot-spare testing |
| | Scheduler for rebuild, verify, and hot-spare testing |
| | Array status monitoring and event notification |
| | User-selectable broadcast and monitoring |
| | Adjustable stripe width |
| Advanced Hardware Features: | 60 NS EDO DIMM memory |
| | Flash upgradable firmware and BIOS |
| SCSI Channels: | (1) AIC-7895 or (1) AIC-7880 motherboard Ultra SCSI chip connected to RAID*port* II slot |
| Device Support: | Up to 15 HDD/non-HDD SCSI devices per motherboard channel |
| Array Support: | Drives can be configured for RAID levels 0, 1, 0/1, and 5 Drives can also be supported in non-array configurations |
| Operating System Support: | Windows NT 4.0 NetWare 4.11 and 3.12 |
| Remote Management: | Windows 3.x Windows 95 Windows NT 4.0 and 3.51 |

## PHYSICAL AND ENVIRONMENTAL SPECIFICATIONS

| | |
|---|---|
| **Dimensions:** | |
| **Length:** | 6.875 inches (17.463 cms) |
| **Height:** | 4.200 inches (10.668 cms) |
| **Operating Temperature:** | 5°C to 55°C |
| **Storage Temperature:** | -55°C to 95°C |
| **Humidity (operating):** | 20% to 90%, non condensing |
| **Power Requirements:** | 5V ± 5% |

BandWidth
™ADAPTEC